NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA

SURATHKAL, MANGALORE - 575 025

Course Code – CS111

Course Name – Computer Programming Lab

Lab - 07

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Submitted To

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Question – 1

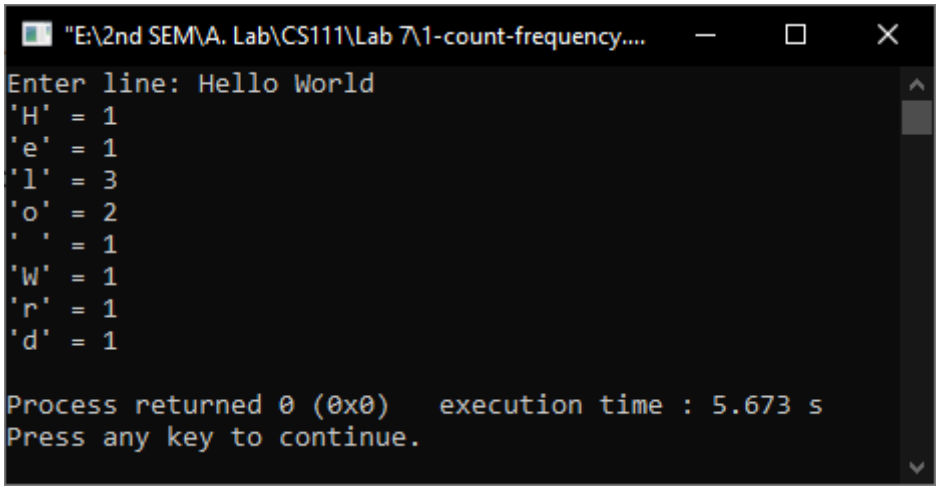
Program to count frequency of every character present in a line of text

Answer

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
    char line[MAX_SIZE];
    char *ptr = line;
    printf("Enter line: ");
    gets(line);
    int i = 0, c, j;
    while (*(ptr + i))
    {
        c = 1;
        j = i + 1;
        if (*(ptr + i) != -1)
        {
            while (*(ptr + j))
            {
                if (*(ptr + i) == *(ptr + j))
                {
                    c++;
                    //replacing character with -
1 which is already counted
                    *(ptr + j) = -1;
                }
                j++;
            }
            printf("'%c' = %d\n", *(ptr + i), c);
        }
        i++;
```

```
    }
    return 0;
}
```

Output



Question – 2

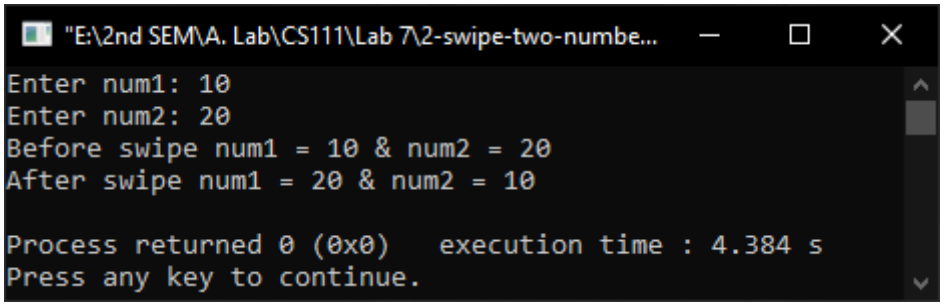
Program to swape two number

Answer

```c
#include <stdio.h>
int main()
{
    int n1, n2, temp;
    int *p1 = &n1, *p2 = &n2;
    printf("Enter num1: ");
    scanf("%d", &n1);
    printf("Enter num2: ");
    scanf("%d", &n2);
    printf("Before swipe num1 = %d & num2 = %d\n", n1, n2);
    //swapping
    temp = *p1;
    *p1 = *p2;
    *p2 = temp;
    printf("After swipe num1 = %d & num2 = %d\n", n1, n2);
```

```
    return 0;
}
```

Output



Question – 3

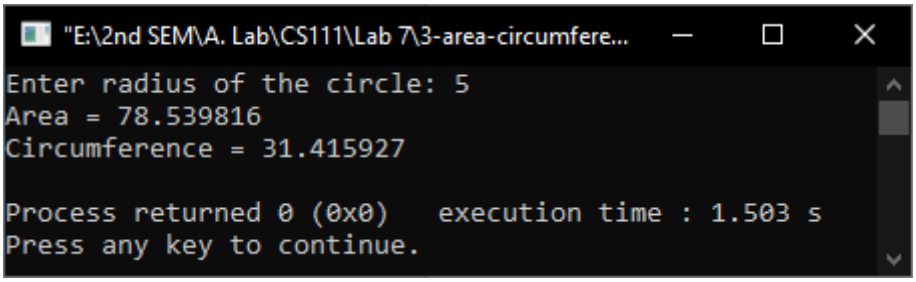
Program to find area and circumference of a circle

Answer

```
#include<stdio.h>
#include<math.h>
#define PI acos(-1)
void calculation(double r, double *area, double *circumferemce);
int main()
{
    double r;
    double *p, area, circumference;
    p = &r;
    printf("Enter radius of the circle: ");
    scanf("%lf", &r);
    calculation(r, &area, &circumference);
    printf("Area = %lf\n", area);
    printf("Circumference = %lf\n", circumference);
    return 0;
}
//calculating area and circumference
void calculation(double r, double *area, double *circumferemce)
{
```

```
    *area = PI * r * r;
    *circumferemce = 2 * PI * r;
}
```

Output



Question – 4

Write functions for the following string operations
a) Concatenation b) Comparison c) Length d) Copy e) Reverse

Answer

```
#include <stdio.h>
#include <string.h>
#define MAX_SIZE 100
//functions
void concat();
void comp();
void length();
void copy();
void rev();
int main()
{
    int select;
    printf("Menu: \n");
    printf("1. Concatenation\n");
    printf("2. Comparison\n");
    printf("3. Length\n");
    printf("4. Copy\n");
    printf("5. Reverse\n");
```

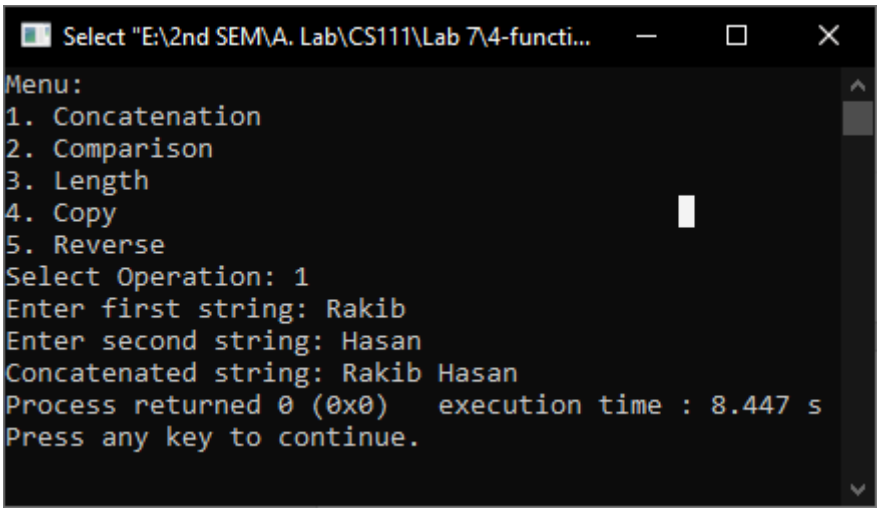
```
    printf("Select Operation: ");
    scanf("%d", &select);
    switch (select)
    {
    case 1:
        concat();
        break;
    case 2:
        comp();
        break;
    case 3:
        length();
        break;
    case 4:
        copy();
        break;
    case 5:
        rev();
        break;
    default:
        printf("Wrong Input. Program Closed");
        break;
    }
    return 0;
}

void concat()
{
    char str1[MAX_SIZE], str2[MAX_SIZE];
    printf("Enter first string: ");
    gets(str1);
    gets(str1);
    printf("Enter second string: ");
    gets(str2);
```

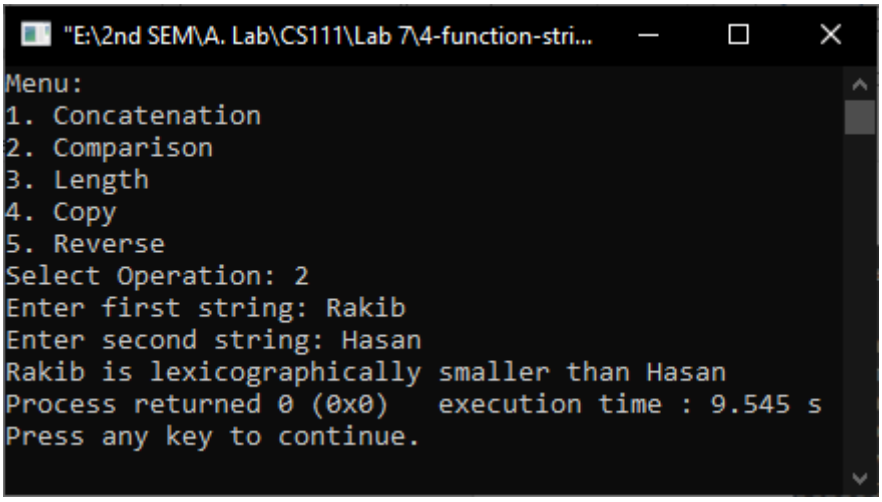
```
    char *s1 = str1, *s2 = str2;
    while (*s1)
    {
        s1++;
    }
    while (*s2)
    {
        *s1 = *s2;
        s2++;
        s1++;
    }
    *s1 = '\0'; //string should end with \0
    printf("Concatenated string: %s", str1);
}

void comp()
{
    char str1[MAX_SIZE], str2[MAX_SIZE];
    printf("Enter first string: ");
    gets(str1);
    gets(str1);
    printf("Enter second string: ");
    gets(str2);
    char *s1 = str1, *s2 = str2;
    int cm = 0;
    while (*s1 && *s2)
    {
        if (*s1 != *s2)
        {
            cm = *s1 > *s2 ? 1 : 2;
        }
        s1++;
        s2++;
    }
```

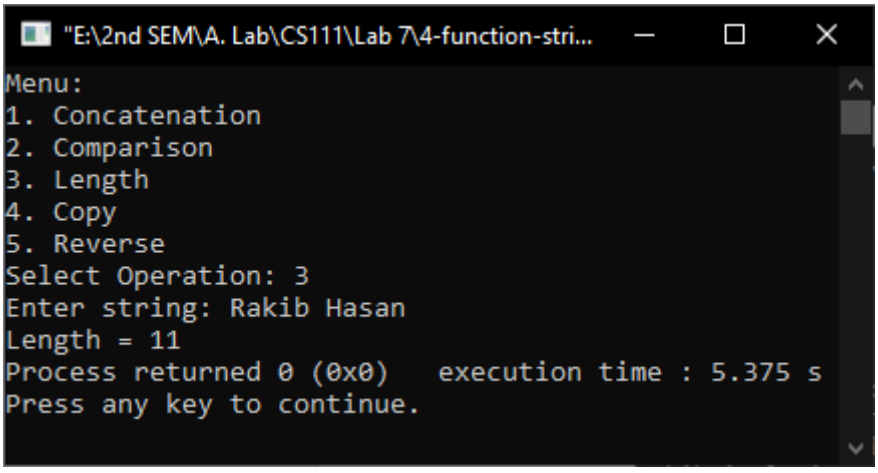
```
    if (cm == 0)
    {
        printf("They both are same");
    }
    else if (cm == 1)
    {
        printf("%s is lexicographically smaller than %s", str2, str1
);
    }
    else if (cm == 2)
    {
        printf("%s is lexicographically smaller than %s", str1, str2
);
    }
}
void length()
{
    char str1[MAX_SIZE];
    printf("Enter string: ");
    gets(str1);
    gets(str1);
    char *s1 = str1;
    int len = 0;
    while (*s1)
    {
        len++;
        s1++;
    }
    printf("Length = %d", len);
}
void copy()
{
    char str1[MAX_SIZE], str2[MAX_SIZE];
    printf("Enter string: ");
```

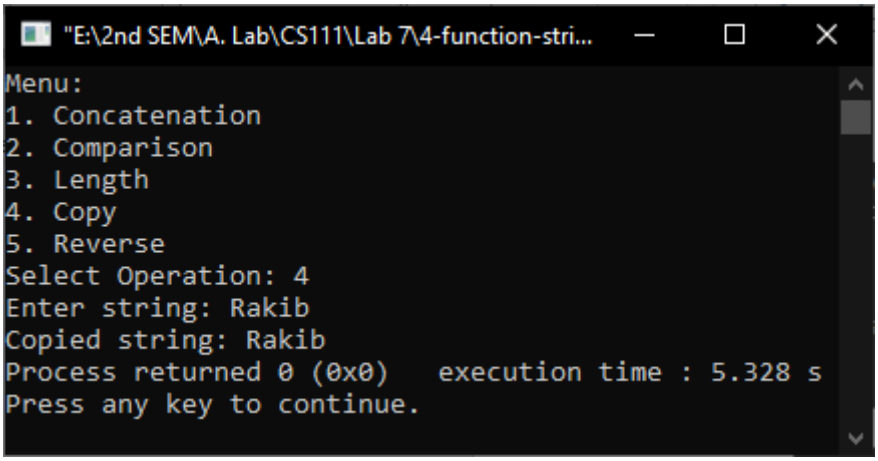
```
    gets(str1);
    gets(str1);
    char *s1 = str1, *s2 = str2;
    while (*s1)
    {
        *s2 = *s1;
        s1++;
        s2++;
    }
    *s2 = '\0'; // string should end with \0
    printf("Copied string: %s", str2);
}
void rev()
{
    char str1[MAX_SIZE], temp;
    printf("Enter string: ");
    gets(str1);
    gets(str1);
    char *start = str1, *end = str1;
    int i, len = strlen(str1);
    end = end + (len - 1);
    for (i = 0; i < len / 2; i++)
    {
        temp = *start;
        *start = *end;
        *end = temp;
        start++;
        end--;
    }
    printf("Reversed string: %s", str1);
}
```

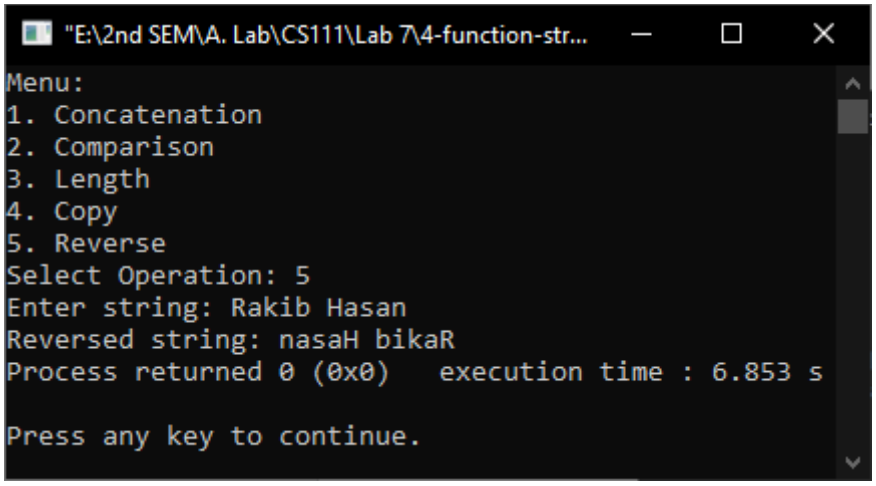
Output


Select "E:\2nd SEM\A. Lab\CS111\Lab 7\4-functi...
Menu:
1. Concatenation
2. Comparison
3. Length
4. Copy
5. Reverse
Select Operation: 1
Enter first string: Rakib
Enter second string: Hasan
Concatenated string: Rakib Hasan
Process returned 0 (0x0)   execution time : 8.447 s
Press any key to continue.


"E:\2nd SEM\A. Lab\CS111\Lab 7\4-function-stri...
Menu:
1. Concatenation
2. Comparison
3. Length
4. Copy
5. Reverse
Select Operation: 2
Enter first string: Rakib
Enter second string: Hasan
Rakib is lexicographically smaller than Hasan
Process returned 0 (0x0)   execution time : 9.545 s
Press any key to continue.


"E:\2nd SEM\A. Lab\CS111\Lab 7\4-function-stri...
Menu:
1. Concatenation
2. Comparison
3. Length
4. Copy
5. Reverse
Select Operation: 3
Enter string: Rakib Hasan
Length = 11
Process returned 0 (0x0)   execution time : 5.375 s
Press any key to continue.





Question – 5

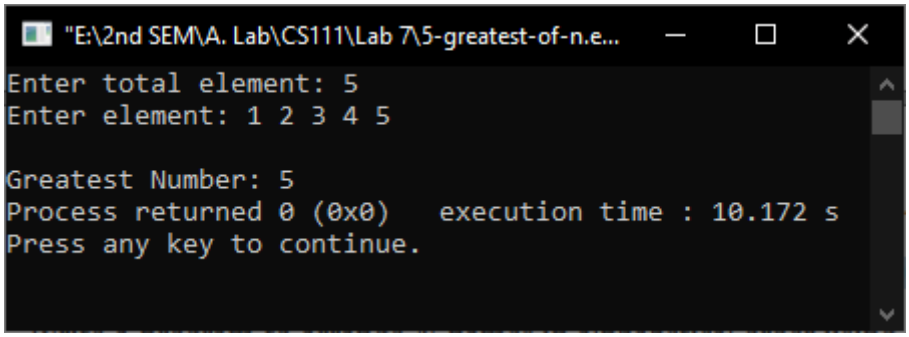
Write a program to display the greatest of N numbers – use malloc() function

Answer

```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int n, i, temp;
    printf("Enter total element: ");
    scanf("%d", &n);
    int *arr;
    arr = (int *)malloc(n * sizeof(int));
    if (arr == NULL)
    {
```

```
        printf("Memory not allocated");
        exit(0);
    }
    else
    {
        printf("Enter element: ");
        for (i = 0; i < n; i++)
        {
            scanf("%d", (arr + i));
        }
        temp = arr[0];
        for (i = 0; i < n; i++)
        {
            if (arr[i] > temp)
            {
                temp = arr[i];
            }
        }
    }
    free(arr);
    arr = NULL;
    printf("\nGreatest Number: %d", temp);
    return 0;
}
```

Output



Qusetion – 6

Write a program to arrange N names in alphabetical order using dynamic memory allocation

Answer

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
    int n, i, j;
    char **names, temp[100];
    printf("Enter total name: ");
    scanf("%d", &n);
    names = (char **)malloc(n * sizeof(char *));
    for (i = 0; i < n; i++)
    {
        names[i] = (char *)malloc(100 * sizeof(char));
    }
    printf("Enter name: ");
    getchar();
    for (i = 0; i < n; i++)
    {
        gets(names[i]);
    }
    for (i = 0; i < n - 1; i++)
    {
        for (j = i + 1; j < n; j++)
        {
            if (strcmp(names[i], names[j]) > 0) //sorting
            {
                strcpy(temp, names[i]);
                strcpy(names[i], names[j]);
                strcpy(names[j], temp);
```

```
            }
        }
    }
    printf("Names in alphabetical order: ");
    for (i = 0; i < n; i++)
    {
        printf("%s ", names[i]);
        free(names[i]);
        names[i] = NULL;
    }
    free(names);
    names = NULL;
    return 0;
}
```

Output